

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
FACT SHEET
(pursuant to NAC 445A.236)

Permittee Name: City of Boulder City
P.O. Box 61350
Boulder City, NV 89006-1350

Permit Number: NEV97022

Location: Boulder City Wastewater Treatment Plant
2000 Buchanan Boulevard, Boulder City, Clark County, NV 89005
Latitude: 35° 56' 00"N, Longitude: 114° 51' 00"W
Township 23S, Range 63E, Sections 22-26
Township 23S, Range 64E, Sections 17, 19-20

General: The Boulder City Wastewater Treatment Plant (BCWWTP) serves 15,000 Boulder City residents. The influent is generated from domestic and commercial connections, and there are no reported industrial facilities in Boulder City, which exempts this facility from industrial pre-treatment requirements. Influent is collected at four lift stations and is delivered to the plant by the east and west interceptor lines. The flow in each 18 in. concrete interceptor line is measured with an ultrasonic flow meter. The plant's headworks consist of a comminutor channel with a manually cleaned barscreen installed in the bypass channel. Biological wastewater treatment occurs in parallel in two concrete-lined aeration basins. Each aeration basin is equipped with four 10-Hp aerators, covers 2.35 acres of surface area and is 14 feet deep. These basins are designed to store 2 ft. of sludge (O&M Manual specification). After aeration, the wastewater is then settled in series in two facultative lagoons. Each facultative lagoon is asphalt-lined, covers 11 acres of surface area and is 5 feet deep.

Facultative lagoon no. 2 has been converted into a duckweed (lemna) lagoon in order to control summer algae blooms. When budded, duckweed accumulates in dense mats within the lagoon's floating barrier grids. Several types of duckweed were investigated until a heat tolerant variety was found. Duckweed covers the water surface and suppresses algae growth by limiting sunlight penetration in the water column. Duckweed also uptakes nutrients (nitrogen and phosphorus) and provides effluent polishing according to the system's developer, Lemna Technologies, Inc. Periodically, the facility harvests the duckweed plants and disposes the vegetation in the municipal landfill. The discharge end of the duckweed lagoon is mechanically aerated to minimize odors in the discharged effluent. Prior to disposal, the effluent is disinfected with bleach (sodium hypochlorite) in a chlorine contact basin. Treated effluent is discharged to Outfall 001 (twin percolation trenches) and Outfall 002 (reuse site). Effluent flow in each outfall is recorded with an ultrasonic flow meter.

Receiving Water Characteristics: Outfall 001 denotes the disposal of effluent by percolation and evapotranspiration in two parallel earthen trenches. Each percolation trench is approximately five feet in width and extends unfenced into the desert for approximately $\frac{3}{4}$ of a mile based on the presence of phreatophytic vegetation. In practice, the vegetation (e.g., cattails, bulrush, shrubs, small trees) is not removed from these trenches except to maintain power line easements. The groundwater quality is not monitored at these trenches since the depth to groundwater is estimated to be in the vicinity of 700 ft. bgs at the BCWWTP disposal site. Outfall 002 denotes an effluent reuse

site at Impact Sand and Gravel Quarry #187 (formerly Gornowich, Inc., permit #NEV93013). The Impact Quarry is located approximately 3 miles west of BCWWTP. This quarry uses treated effluent for dust control and sand/gravel washing. The depth to groundwater at the Impact Quarry is estimated in the vicinity of 275 ft. bgs.

Overall, the groundwater supply and potable quality in the Boulder City vicinity are limited. In this basin, groundwater supplies are primarily used for non-potable uses at mining/quarrying operations. Lake Mead (Colorado River) supplies Boulder City with its domestic water supply. BCWWTP no longer has plans in the immediate future to provide reclaimed effluent to these formerly permitted outfalls (Outfall 005 was pending) in discharge permit #NEV97022 due to ample potable supply from Lake Mead:

1. Outfall 003: City of Boulder City (ConStrux) Sand & Gravel Pit;
2. Outfall 004: Veteran's Memorial Park & Wetlands Project;
3. Outfall 005: Veteran's Memorial Cemetery (potential reuse site).

Flow: The design capacity of BCWWTP is 1.81 MGD. Presently, 0.7 MGD is discharged to Outfall 001 (percolation) and 0.5 MGD is discharged to Outfall 002 (reuse). Discharge permit #NEV93013 allows the Impact Quarry to use up to 0.8 MGD of BCWWTP effluent.

Proposed Effluent Limitations and Special Conditions:

Table 1: Plant Discharge Limitations

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	30-Day Average	Daily Maximum	Measurement Frequency	Sample Type
Flow, MGD (Influent)	1.81		Continuous	Flow Meter
Flow, MGD (Effluent to 001) ¹	Monitor & Report		Continuous	Flow Meter
Flow, MGD (Effluent to 002) ²	Monitor & Report		Continuous	Flow Meter
CBOD, mg/L (Influent)	Monitor & Report		Weekly	Composite
CBOD, mg/L (Effluent)	30	45	Weekly	Composite
TSS, mg/L (Influent)	Monitor & Report		Weekly	Composite
TSS, mg/L (Effluent)	45	65	Weekly	Composite
pH, Std. Units (Effluent)	Between 6.0 – 9.0		Weekly	Discrete
Fecal Coliform, cfu or mpn/100 ml (Effluent)	200	400	Weekly	Discrete

Priority Pollutant Metals Analysis, mg/L (Effluent) ³	Monitor & Report	Annually (4 th Quarter)	Discrete
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1. Two earthen percolation channels.
2. Impact Sand & Gravel Quarry #187 (#NEV93013).
3. The thirteen (13) priority pollutant metals in Appendix A to 40 CFR, Part 423 are: Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, and Zn.

Rationale for Permit Requirements: The proposed monitoring requirements are consistent with the current permit requirements, with the following exceptions:

- *Nitrogen Monitoring:* Nitrogen species monitoring is no longer required since effluent is not supplied for landscape irrigation at Outfalls 004-005. Outfall 002 does not involve landscape irrigation.
- *CBOD vs. BOD₅:* BCWWTP operates partial mix and facultative treatment lagoons where nitrification of ammonia may not be complete (i.e., incomplete conversion of ammonia (NH₃) in lagoons to nitrate (NO₃)). For lagoon (pond) treatment systems, the Division recommends that Carbonaceous Biochemical Oxygen Demand (CBOD or Inhibited BOD) be reported in place of 5-day Biochemical Oxygen Demand (BOD₅).
- *Metals Analysis:* BCWWTP tests its effluent annually for 10 priority pollutant metals as a check on the presence/absence of industrial contaminant indicators. The Division recognizes 13 metals as priority pollutant metals and proposes that BCWWTP sample its effluent annually for the 13 priority pollutant metals identified as: antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), and zinc (Zn).

Schedule of Compliance: The Permittee shall submit the following items to review and approval to the attention of:

Mr. Nadir Sous, Supervisor
Nevada Division of Environmental Protection
Bureau of Water Pollution Control
1771 E. Flamingo Rd.
Suite 121-A
Las Vegas, NV 89119

- The Division notified the facility in writing on May 8, 2003 that it is required to commence sludge removal efforts in the lagoons in order to minimize septic odors and improve treatment operations. Within thirty (30) days of the permit issuance date, the facility shall submit a sludge management and odor reduction plan for the treatment lagoons.
- The percolation trenches (Outfall 001) are not fenced. The Division requires the facility to post the outside runs of these trenches to warn the public of potential exposure hazards with the treated effluent. The warning signs shall indicate that contact with the treated wastewater effluent is to be avoided. Within ninety (90) days of the permit issuance date, the Permittee shall post the outside runs of the percolation trenches with warning signs at 500 ft. spacing

intervals and submit photographic documentation of the completed work.

- The Division's copy of this facility's O&M Manual is dated February 1986. The facility shall provide the Division with a copy of an updated O&M Manual including sections on the duckweed (lemna) system and sludge management and odor control practices for the treatment lagoons. Within ninety (90) days of the permit issuance date, the Permittee shall submit for review and approval a revised copy of the O&M Manual. The O&M Manual shall be prepared in accordance with the Division's WTS-2 guidance: *Minimum Information Required for an Operations and Maintenance Manual*.
- Within one hundred and eighty (180) days of the permit issuance date, the Permittee shall submit a progress report documenting its investigation in upgrading and/or replacing the existing treatment lagoon system.

Procedures for Public Comment: The Notice of the Division's intent to issue (renew) a discharge permit to the BCWWTP, subject to the conditions contained within the permit is being sent to the **Las Vegas Review-Journal** and **Boulder City News** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of thirty (30) days following the date of publication of the public notice in the newspaper. The comment period can be extended at the discretion of the Administrator. The deadline date and time by which all comments are to be submitted (via postmarked mail or time-stamped faxes, e-mails, or hand-delivered items) to the Division is **September 12, 2003 by 5:00 P.M.** A copy of the public notice and fact sheet can also be downloaded from the Division's website at the following address: <http://ndep.nv.gov/admin/public.htm>

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Proposed Determination: The Division has made the tentative determination to issue (renew) the proposed discharge permit for a period of five (5) years.

Prepared by: Mark A. Kaminski, P.E.,
Staff Engineer III
Bureau of Water Pollution Control

Date: August 7, 2003

BOULDER CITY WWTP (05/15/03)



#1. Aeration basin no. 1



#2. Aeration basin no. 2



#3. Facultative lagoon no. 1



#4. Fac lagoon no. 2 (lemna not budded)



#5. Lemna harvesters & effluent aeration



#6. Twin perc trenches in desert